



# BLACK SWANS ANOMALIES TESTING ON INDONESIA STOCK EXCHANGE

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## *Abstract*

*This Research aim to know Black Swan Anomalies happen in BEI to stock indexes LQ45 make overreaction and make price reversal and winner-loser anomalies. to test abnormal return use One Sample T-test and to know overreaction so make price reversal and winner-loser anomalies use Paired Sample T-Test. Based on result and discussion concluded that Black Swan Anomalies come on in BEI for stock indexes and effect Black Swan Anomalies are bleed and blowup make happen overreaction so make price reversal and winner-loser anomalies happen in BEI for stock indexes LQ45.*

**Keywords :** *Black Swans Anomalies, overreaction, Price Reversal, Winner-Loser Anomalies*

## *Abstrak*

Penelitian ini bertujuan untuk mengetahui Apakah *Black Swans Anomalies* terjadi pada BEI untuk Indeks saham LQ45 sehingga menyebabkan *overreaction* bagi trader dan menyebabkan terjadi *price reversal* dan anomali *winner-loser*. pengujian *abnormal return* menggunakan analisa *One Sample T-test* dan untuk mengetahui terhadap *overreaction* yang menyebabkan terjadinya *price reversal* dan anomali *winner-loser* dengan uji *Paired Sample T-Test*. Berdasarkan hasil pengolahan data dan pembahasan penelitian dapat disimpulkan bahwa *Black Swans Anomalies* terdapat di BEI untuk indeks LQ45 dan akibat sifat dari *Black Swans Anomalies* yaitu *bleed* dan *blowup* menyebabkan reaksi berlebihan/ *overreaction* sehingga fenomena *price reversal* dan anomali *winner-loser* terjadi dalam BEI untuk indeks LQ45.

**Kata kunci :** *Black Swans Anomalies, Overreaction, Price P eversal, Anomali Winner-Loser*

JEL: M31

## **1. Research Background**

Capital market is the place where trader is doing investment by investing their capital. In today's capital market almost every unexpected events can rise and that thing affecting in stock exchange and the world. The crisis that happened in 1997 and 1998 caused by stock of foreign debt that was really large and commonly short termly, the tragedy of WTC which attacked by terrorist in 2001 and the economic crisis in 2008, which some people said as the global economic crisis, which was different from the crisis of 10 years ago. That event has been affecting the world economic including Indonesia and the event called as Black Swan Anomalies which supported by Taleb (2007) which explained about Black Swan Anomalies has three criteria which are rare event, big impact, hard to be predicted, and out of ordinary thought.

Yudkowsky (2008) said that Black Swan Anomalies are included in financial bias.

Financial bias is against the concept of Efficient Market Hypothesis (EMH). Some literatures said that capital market is an efficient market that reflect all information. In Efficient Market Hypothesis (EMH) which stated by FAMA (1970), there are three levels of forms of capital market efficiency in the correlation with the existence of information which provided for market players. The three forms are capital market with weak, half strong, and strong form.

Financial bias is caused by the irrational character that makes all traders overreact towards news, whether it is positive or negative news so that it makes the stock price going up and down which is called as overreaction. Aside from that, Taleb (2007) mentioned the way trader lost money in capital market which is bleed or blowup. The meaning of bleed is when a trader is having small loss from time to time but when the Black Swan Anomalies happens the trader gets a lot of profit and no limitation due to the happening of Black Swans, so that Black Swan Anomalies can change a trader condition that has loser stock into winner stock. Meaning of blow up (Taleb, 2007) is when a trader is having small profit from time to time by taking big risk, but when Black Swan Anomalies happen the trader will get a big loss even the initial investment fund and Black Swan Anomalies will end when the fund is gone already, so that Black Swan Anomalies can change winner stock to loser stock and that thing causes winner-loser anomaly. Winner - loser anomaly caused by the price reversal which is the inversion of price whereas that thing will give abnormal return for trader and make the market becomes inefficient, this matter supported by the research by DeBondt and Thaler (1985) who found that overreaction behavior can cause winner-loser stocks reversal toward stock in NYSE.

Previous research showed the existence of black swan anomalies phenomenon which will happen if there is crisis within the country which mean negative characteristic and bad economic (bearish) and from outside of the country it looks like crisis but the impact is not directly felt but at certain time after the crisis happens in accordance with research by Peša et.al (2015).

Within a country micro component do not totally have direct impact with the Black Swans, according Peša and Brajkovic (2016) that exchange rate, GDP, interest rate, non-performing loans, unemployment rates do not have direct impact towards Black Swans, so that in determining if the trader have to do holding or no is really hard because Black Swans cannot be determined when it will happen in accordance with Lavisolo and Leal (2013) and that matter will take effect on trader psychologic so that it causes the bias which is supported by the research by De Bondt and Thaler (1985).

The bias that happen is because the absent of supportive information source in decision taking to do holding or no, according to research by Ottemoesoe and Malelak (2014) will cause the overreaction which will cause the winner-loser effect just like the research by De Bondt and Thaler (1985) and causing price reversal which is supported by the research of Sulasmiyati (2016). This matter can be connected to Taleb (2007), explained that the phenomenon that unpredictable occur can cause the happening of overreaction.

In research by Estrada (2009) mentioned that Black Swans Anomalies will emerge in emerging market, meanwhile according to World Bank (2014) mentioned that Indonesia is the country belongs to the group of economically developing country which is included to emerging market. Emerging market of a market within the countries that cannot be said as advance but have economic condition which included to good so that the testing for Black Swans Anomalies will be tested in Bursa Efek Indonesia (BEI) in the stock that included to LQ45 because LQ45 index is one of the most fluctuate which caused by the high liquidity and market activities.

Aside from that, the security price within the efficient market will respond the information as soon as it is accepted. Information is the main factor towards the change certain stock price the information change that accepted by traders will affect their action in terms of investing in stock market. Traders tend to emphasize recent information and ignore the previous one. Because of that if there is any negative information which related to the stocks

that the trader has, the trader will take big sales for the stocks that they own. That sale will cause sharp price change and within short period of time. This thing identifies the irrational thought of the investor. As the time goes by, when the traders realize that their reaction are overreacting in responding to those information, the stock price reversal is slowly happening (Benou and Richie, 2003).

Yudkowsky (2008) mentioned that in finance there are a lot of causes so that the bias happens to traders, this bias divided into ten kinds which one of them is Black Swans Anomalies. According to Taleb (2004), in his second book, *Black Swans: The Impact of Highly Improbable*, mentioned that the ways for a trader to loss their money are bleed of blowup. Meaning of bleed is when a trader is having a small loss from time to time but when Black Swan Anomalies happens so the trader gets an amazing profit and there is no limit for it because of the Black Swans, the opposite of that is blowup.

Meaning of blowup is when a trader is having small amount of profit from time to time by taking a big risk but when the Black Swans Anomalies happens the trader will loss so much up until they loss the initial investment fund and Black Swans Anomalies will end if the investment is gone already. Black Swans Anomalies itself is an event with three specific characteristics first, it is an event out of expected hope, and because of that there is no indication in the past. Second is its extreme impact. And the third one is even though the event is unpredictable, human nature tries to explain the event and make it clear and predictable (Taleb, 2009 in PešadanBrajković, 2016).

Black Swans Anomalies is an unpredictable event because its place is out of common expectation, and it did not happen in the past so it is impossible to show the result (Estrada, 2009). According to Sniedovich (2012), Black Swans Anomalies has big impact in individual life and organizational evolution such as history making. Taleb said that the dependency to formal model such as habit for years causes mistake in decision making in financial sector and affects to global financial system.

The phenomenon of trader overreacting or usually called overreaction is a manifestation of market inefficiency (Susiyanto, 1997). Meanwhile according to De Bondt and Thler, overreaction Hypothesis stated that market has overreacted towards an information. Traders tend to put stock price which is too high towards information that considered to be good by other traders and in the opposite. Traders tend to set a price which is too low towards bad information.

Overreaction Hypothesis refers to the psychological application research which is human tend to overreact towards a news or event which have dramatic characteristics. Psychologically, market players tend to give dramatic reaction towards bad news, that because basically human being do not want to feel any pain according to prospect theory. Prospect theory can be used to analyze all kinds of phenomenon of human behavior in many areas of life, especially in decision making process that is irrational. This theory also used to measure the measurement perspective aversion or risk-seeking (Wilkinson, 2008).

The existence of overreaction in stock market caused some implications for investor and also stock market practitioner, which are, Price reversal, price reversal or price inversion is the inversion of stock price because trader make mistake in setting the stock price (miss pricing) (Santoso, 2010). Price reversal phenomenon happens when there is demand/ offer that is too much and the volume moves in the same direction as the trend so that change happens towards tendency which has been formed so far. So that price reversal called as reversal effect which is the average reversal effect of return which usually called as winner-loser anomaly which is stock that has bad performance (loser) will reverse and turns into stock with good performance (winner) in the next period and so does the opposite. (De Bondt and Thaler, 1985). Stock that has gotten up and down of the price will keep experiencing increase and decrease of price although there is no new information related to company fundamental. That price momentum will stop and followed by the inversion caused by price correction by the traders. That thing

proved that stock price does not always reflect the company intrinsic value so that trader can get abnormal return. Psychological factor of trader tends to push the mispricing to happen in stocks that relatively hard to predict such as small company stock or company that is vulnerable to external condition. The success of predicting the price in short term can cause overconfidence which pushes trader to do certain investment strategy, one of them is contrarian strategy (Yill and Kimirzi, 2012).

Winner-loser anomalies, winner-loser anomalies are one of the form of stock market anomaly that in contrary with the concept of efficiency market. Winner-loser anomalies first introduced by De Bondt and Thaler which stated that stocks which at first give a very positive profit level (winner) or really negative (loser) will experience inversion (reversal) in below periods. Investor that buy loser stocks and sell those stocks when they become winner will get significant abnormal return.

De Bondt and Thaler stated that the cause of this anomalies is the overreaction hypothesis by the traders. This hypothesis stated that basically the market has reacted over towards the information. In this case, the market players tend to determine stock price that is too high as the reaction towards the news that considered to be good and give low price as the reaction towards news that considered to be bad.

Overreaction hypothesis is human reaction that tend to overreact towards the news or event that have dramatic characteristic. This hypothesis predicts that security which included to loser category which usually has low return usually will have high abnormal return. In the opposite, security that usually has high return which included to winner category will get low abnormal return (Sukmawati and Hermawan, 2003). There are two overreaction hypothesis phenomenon (De Bondt and Thaler, 1985) in Sukmawati and Herman (2003), which are extremely high security price will be followed by opposite price change and the higher the price movement the bigger adjustment that must be done.

The market that overreact has impact towards the price inversion/ price reversal that should be able to be predicted from past performance. Return in long period can be used to show that the market act overreacts towards information, this thing is opposite with efficiency market that stated stock market adjusting really quick and precise through new information. So it can be said that the overreaction existence shows that the market is not efficient in the weak, half strong, and strong form (Dissanaike, 1997) in Kusumawardhani (2001).

Next, it can be concluded that overreaction hypothesis from investor or stock practitioner in judging an information causes the stock valued as too high or too low. Then, when the investor realizes that the mistake there will be opposite stock movement as correctional movement. This condition illustrates a price inversion direction and when those stocks which at the beginning give a very positive profit (winner) or very negative (loser) will experience inversion (reversal) within these certain periods. Investor that buy loser stocks and sell those stocks when those become winner in order to obtain significant abnormal return. So that it can be said that overreaction hypothesis can be figured out throughout the stock price inversion/ price reversal after a new information occurs and condition change from winner to loser from the next period and the opposite.

Based on the facts that show that overreaction can happen on stock when there is news or event that have positive or negative dramatic characteristic, in this terms is Black Swans and from the research that has been done figured out that Black Swans will happen from emerging market and Indonesia included into the country that categorized as emerging market in economy., then the hypothesis of "Black Swans that have positive and negative characteristic can cause overreaction from investor/ stock practitioner so that the price reversal phenomenon and winner-loser anomalies happened in BEI for index LQ45" is determined.



## 2. Research Method

In this research the main variables used can be defined operationally as follows: *Abnormal Return*, is the extra from the real return (actual return) compared to return that is expected (expected return). The method that used in this research is market adjusted model, which is the difference between individual stock return with market return.

$$Ar_{it} = r_{it} - r_{mt}$$

whereas  $Ar_{it}$  is *Abnormal return* of company in t period, dan  $R_{it}$  is *Actual Return* company in t period, dan  $R_{m,t}$  is *Expected Return* company in t period. Some research about case study also use abnormal cumulative return or the sum of abnormal return from the day before within period of event for each stock,  $CAR = \sum AR_{it}$ , whereas  $CAR$  is *Cumulative Abnormal Return* and  $\sum AR_{it}$  is the sum of *abnormal return*.

Data used is the stocks that listed and traded in BEI within the positive and negative event which consist of: stocks which included into traded actively category and company stock data which including sample must be provided. If the data sample is not available the sample will be eliminated from research sample, winner stocks is the stock that experience higher price increasing than average stock price increasing within research period and Loser stock is stock that experience high price decreasing during the average price decreasing event within the research period. Next is the criteria of sampling selection which are first, company must be listed in BEI within 5 days before the positive and negative events and in 20 days after positive and negative events happen and included into index LQ45 and second, stocks that used are those that consistently listed in LQ45 index within 5 days' period before positive and negative events and 20 days after positive and negative events happen and not a newcomer. Stock defined as traded actively if within 3 months of frequency the trading transaction must be more than 75 times.

To identified black swans is done by these nest steps, Black Swans events has 3 basic criteria that must be fulfilled which are rare event, huge impact, hard to predict and out of ordinary thought. In determining event that will be used must consider those 3 criteria in stock which can be assumed to have high abnormal return of higher than  $\pm 5\%$  for positive and negative events. (supported by Estrada and Vargas (2012), which mentioned the comeback return must be more than  $\pm 5\%$ ), for the positive and negative events can be seen in attachment 1. In this research, stocks that are included into sample are classified again into winner and loser stocks group categories. The one that categorized as winner is the stock that is having higher price increasing compare to average stock price increasing throughout the research period. Meanwhile the one included into loser is the stock that is having stock price decreasing in the average stock market price decreasing event throughout the research period (Kusumawardhani, 2001). For the identification of winner-loser stock category can be seen in attachment 2.

To identify the happening of price reversal and winner-loser anomaly event is done by certain steps as follows:

1. Identify daily stock price change event ( $t = 0$ ) to determine winner and loser stock sample.
2. Identify the stock price inversion after the daily stock price change. This identification can be done by looking *average abnormal return of winner and loser* stocks during the observation period ( $t = -5$ ) up to ( $t = 20$ ).

The use of observation period ( $t = 5$ ) before the big stock price change is to prevent bias caused by another dramatic event. Meanwhile the reason to use period ( $t = 20$ ) after big stock price change is to know the inversion that happen, because if the period is too short it will be hard to identify the inversion. This thing also considering the stock market condition which is

still in developmental stage. This observation period follows observation period that used by Lucia Iswandari (2001) and AgusWibowo and Agus Sukarno (2004). If abnormal return came after the significant big stock price change and is going to different direction (up/down), means that there is a price inversion (Kusumawardhani, 2001).

The steps that need to be done are by counting abnormal return for each winner and loser stocks during the observation method. The number of abnormal return counted by using Market Adjusted Model. To know AAR and CAAR that causes price reversal and winner-loser anomalies.

The steps that done in data processing is by determining the right model and analyzing tool to solve the research problem that has been explained before. In first part, descriptive statistical data processing that used to stock result level analysis is average. Those secondary data processed to get abnormal return during test period. In order to identify the price inversion event in BEI t test is conducted in order to find out the significance from Average abnormal return for t day forward can be counted by arithmetic average.,

$$AAR_t = \frac{\sum_{i=1}^n ARI_{i,t}}{n}$$

Whereas AAR<sub>t</sub> is the Average Abnormal Return in t period, Ari,t is the Abnormla Return of stock in t period, and n is the number of stock. And to count the result level that form as r can be used cummulative Average Abnormal Return (CAAR) with the formula,

$$CAAR_t = \left[ \frac{\sum ARI_{i,t}}{N} \right]$$

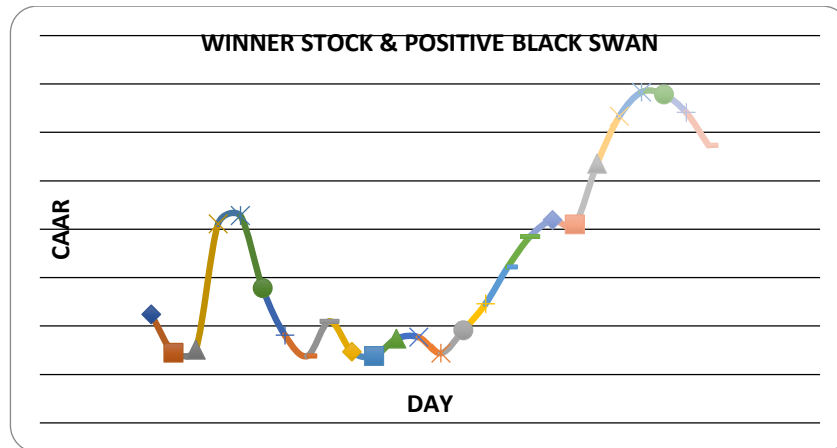
Whereas AAR<sub>t</sub> is Average Abnormal Return,  $\sum ARI_{i,t}$  is the total abnormal return, and N is number of data.

In order to test the hypothesis towards abnormal return existence using the One Sample T-test analysis with the significance level used has three criteria which are  $\alpha = 1\%$ ,  $5\%$ , and  $10\%$ , the smaller the significance the smaller the mistake in the abnormal return counting so that data result is more accurate and for winner stock, the abnormal return value is positive and loser stock the abnormal return value is negative. For the test towards overreaction uses Paired Sample T-test testing for the abnormal return in Black Swan event, whether it is positive or negative characteristic with the CAR during the price inversion day. In order to know whether overreaction happens or no, it can be seen from the probability sample value,  $\alpha = 1\%$ ,  $5\%$ , and  $10\%$ , if less than  $\alpha$  then overreaction is happening.

## **RESULT AND DISCUSSION**

### **Winner Stock Price Inversion**

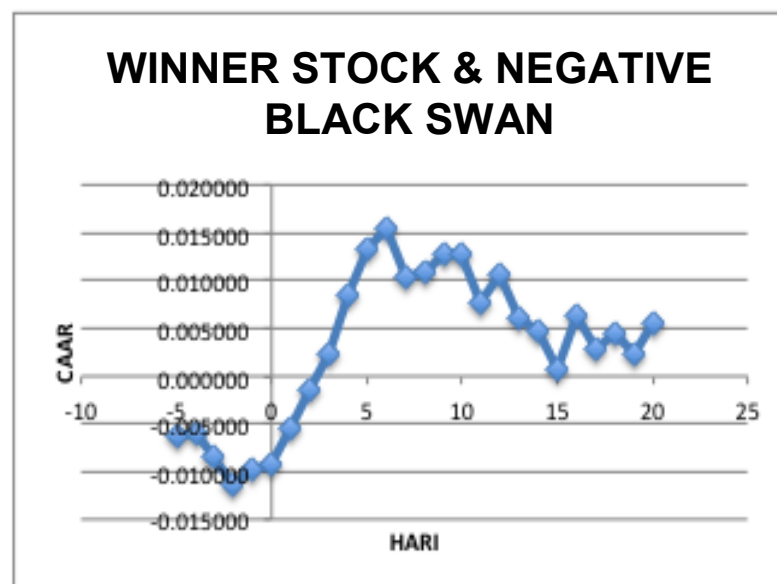
Based on the abnormal return (attachment 3), it is known that there is price reversal phenomenon happened in winner stock during t+14, t+18 and t+19 caused by Black Swan Positive in 26<sup>th</sup> May 2010 and supported by the result of scatter plot (figure 1) that shows the Cumulative Average Abnormal Return (CAAR) result movement of the winner stocks during observation period (t = -5 up to t = 20) shown that the negative jump on t=0 so that Black Swan Positive has impact towards stock return.



Source: yahoo finance, processing

**Figure 1. Winner Stock CAAR caused by Positive Black Swan from  $t = -5$  up to  $t = 20$**

Based on abnormal return (attachment 4) known that there was no price reversal phenomenon in winner stock caused by Negative Black Swan in 22<sup>nd</sup> September 2011, it is supported by scatter plot in figure 2 by using the Cumulative Average Abnormal Return (CAAR) result, shows that the jump happened in  $t-4$  before  $h$  day so that Negative Black Swan does not have impact towards stock return.



Source: yahoo finance, processing

**Figure 2. Winner Stock CAAR caused by Negative Black Swan from  $t = -5$  up to  $t = 20$**

#### Winner Stock for Positive Black Swan Event

Table 1 shows the positive correlation connection between  $AR_{t=0}$  and  $CAR_{t+14}$  with 0.68 value and positive correlation connection between  $AR_{t=0}$  and  $CAR_{t+14}$  has significance value of 0.005 less than  $\alpha=1\%$ , so that the value is less significance and from the sample result shows probability is less than  $\alpha=1\%$ , so that it can be concluded that there was overreaction that caused price reversal phenomenon and winner-loser anomalies in  $t+14$ .

**Table 1 Paired Sample T-test Result of Winner Stocks Connection for Negative Black Swan Event ( $t+14$ )**

Paired Samples Correlations				
Pair 1		N	Correlation	Sig.
	AR0 & CAR t+14	15	0.68	0.005*

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2-tailed)
	AR0 – CAR t+14	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
					-0.0360	0.03874			

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Table 2 shows that there is positive correlation connection between AR t=0 and CAR t18 with 0.39 value but the positive correlation connection between AR t=0 and Car t-18 has significance value 0.149, because of that the value is insignificant and can be concluded that there is no overreaction that caused price reversal phenomenon and winner-loser anomalies in t-18.

**Table 2 Paired Sample T-test Result of Winner Stocks Connection for Negative Black Swan Event (t+18)**

Paired Samples Correlations				
Pair 1		N	Correlation	Sig.
	AR0 & CAR t+18	15	0.39	0.149

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2-tailed)
	AR0 - CAR t+18	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
					-0.0629	0.08231			

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Table 3 shows the positive correlation connection between AR t=0 and CAR t-19 with 0.377 value but the positive correlation connection between AR t=0 and car has significance value of 0.166, so that the value is insignificant and can be concluded that there was no overreaction that caused price reversal phenomenon and winner-loser anomalies in t\_19.

**Table 3 Paired Sample T-test Result of Winner Stocks Connection for Negative Black Swan Event (t+19)**



Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	AR0 & CAR t+19	15	0.377	0.166

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2-tailed)
	AR0 - CAR t+19	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
					-0.05907	0.08306	0.02145	-0.0968	-0.02129

\*significance at  $\alpha=1\%$

\*\*significance at  $\alpha=5\%$

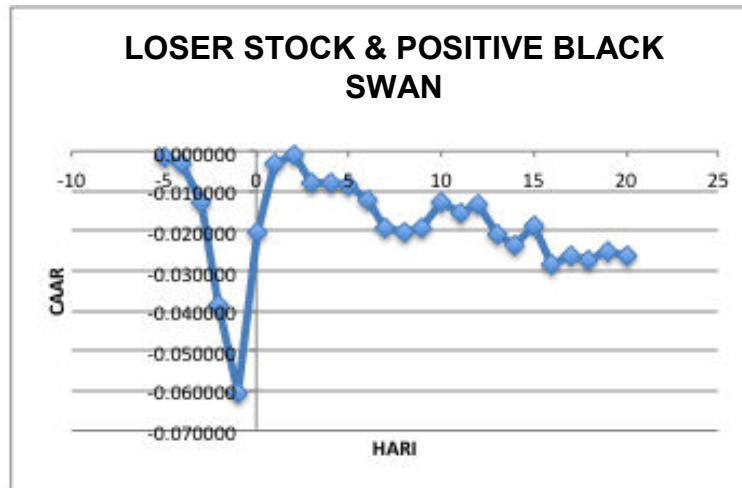
\*\*\*significance at  $\alpha=10\%$

From the result it is mentioned that in t-14 day there was overreaction that caused trader to experience what called as blowup, whereas the thing is in accordance with Taleb (2004) that said if a trader is having small profit (winner stock) from time to time with taking big risk but then when Black Swans Anomalies happen then the trader will loss so many, even the initial investment fund and Black Swans Anomalies will end if the investment is already gone.

Supported by the research by Djojopronot and Mahadwartha (2015) that the bullish (Positive Black Swan) condition will causes the investors to feel more confidence and over optimistic so that it will trigger more asymmetrical information and cause representative bias in processing the information so the investor cannot do rational analysis so that it causes the investor become overreaction towards the news that exist and that thing will finally cause price reversal and winner anomalies happen.

### Loser Stock Price Reversal

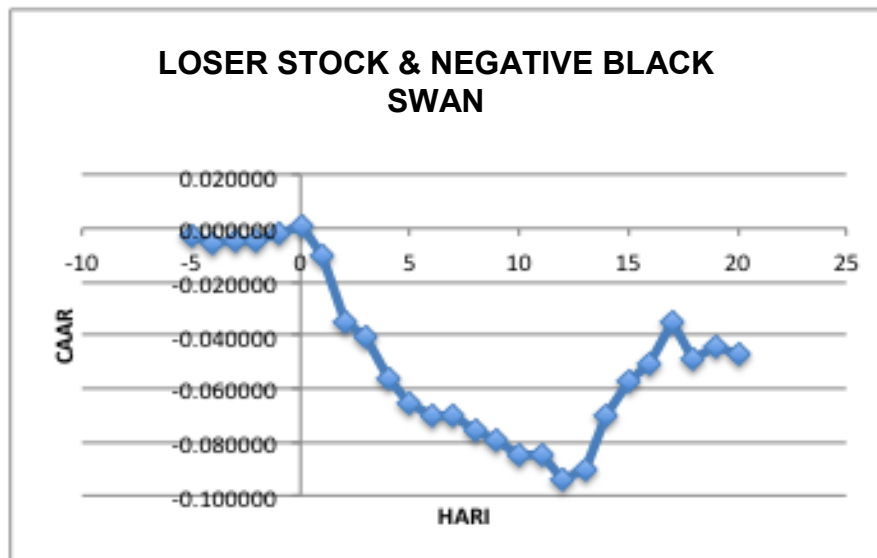
Based on the abnormal return (attachment 5) can be found that there was price reversal in loser stock caused by Positive Black Swan in 26<sup>th</sup> May 2010 in t+10 which is supported by scatter plot in figure 3 by using the Cumulative Average Abnormal Return (CAAR) result which shows that positive jump happened in t=0 caused by Positive Black Swan so that it has stock return impact.



Source: yahoo finance, processing

**Figure 3 Stock Loser CAAR Caused by Positive Black Swan from  $t = -5$  up to  $t = 20$**

Based on abnormal return (attachment 6) that there was stock price reversal phenomenon in  $t+17$  caused by Negative Black Swan at 22<sup>nd</sup> September 2011 and supported by scatter plot result (figure 4) that shows the Cumulative Average Abnormal Return (CAAR) result movement of winner stocks within observation period ( $t = -5$  up to  $t = 20$ ) shows that positive jump happened at  $t=0$  caused by Negative Black Swan so that it has stock return impact.



Source: yahoo finance, processing

**Figure 4 Winner Stock CAAR caused by Negative Black Swan from  $t = -5$  up to  $t = 20$**

### Loser Stock for Positive Black Swan Event

Table 4 shows the negative correlation connection between AR  $t=0$  and CAR  $t+10$  with -0.071 value but the negative correlation connection between AR  $t=0$  and CAR  $t+10$  has significance value of 0.787, so that the value is insignificant and can be concluded that there was no overreaction that caused price reversal and winner-loser anomalies phenomenon in  $t+10$ .

**Table 4 Paired Sample T-Test result of Loser Stock Connection for Positive Black Swan Even(t+10)**

Paired Samples Correlations				
Pair 1		N	Correlation	Sig.
	AR0 & CAR t+10	17	-0.071	0.787

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2-tailed)
	AR0 – CAR t+10	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
					0.05278	0.12949			
							1.681	16	0.112

\*significance at  $\alpha=1\%$

\*\*significance at  $\alpha=5\%$

\*\*\*significance at  $\alpha=10\%$

#### Loser Stock for Negative Black Swan Event

Table 5 shows the negative correlation connection between AR t=0 and CAR t+14 with -0.254 value but the negative correlation connection between AR t=0 and CAR t+14 has significance value of 0.325, so that the value is insignificant and can be concluded that there was no overreaction that caused price reversal and winner-loser anomalies phenomenon at t+14.

**Table 5 Paired Sample T-Test Result Loser Stock Connection Black Swan Negative Event(t+14)**

Paired Samples Correlations				
Pair 1		N	Correlation	Sig.
	AR0 & CAR t+14	17	-0.254	0.325

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2- tailed )
	AR0 – CAR t+14	Mean	Std. Deviatio n	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
		0.0726 7	0.07828	0.01899	0.0395 2	0.1058 1	3.827	16	0.001

\*significance at  $\alpha=1\%$

\*\*significance at  $\alpha=5\%$

\*\*\*significance at  $\alpha=10\%$

Table 6 shows the negative correlation connection between AR t=0 and CAR t+17 with -0.42 value and negative correlation connection between AR t=0 and CAR t+17 has significance value of 0.093 which is less than  $\alpha=10\%$ , so that the value is significant and from the sample result shows probability of 0.032 is less than  $\alpha=5\%$  so that can be concluded that there was overreaction that caused price reversal and winner-loser anomalies phenomenon at t+17.

**Table 6 Paired Sample T-Test Result of Loser Stock Connection for Negative Black Swan Event(t+17)**

Paired Samples Correlations				
Pair 1		N	Correlation	Sig.
	AR0 & CAR t+17	17	-0.42	0.093***

Paired Samples Test									
Pair 1	Paired Differences						t	df	Sig. (2-tailed)
	AR0 – CAR t+17	Mean	Std. Deviation	Std. Error Mean	90% Confidence Interval of the Difference				
					Lower	Upper			
					0.03776	0.06612			
		6	0.06612	0.01604	6	6	2.354	16	0.032*

\*significance pada  $\alpha=1\%$

\*\*significance pada  $\alpha=5\%$

\*\*\*significance pada  $\alpha=10\%$

From the result it can be seen that on t+17 day there was overreaction that caused trader had something called bleed whereas that thing is in accordance with Taleb (2004) that mentioned when a trader is having small loss (loser stock) from time to time but when Black Swans Anomalies happens the trader will get a big amount of profit and there is no limit of the profit due to the Black Swans and it is in accordance with the opinion from Ottemoesoe and Malelak (2014), which is overreaction can be detected if there is a price change and it happens in the bad economic condition (Negative Black Swan). That is in accordance with the statement of De Bondt and Thaler (1985) where they assuming that overreaction will happen to news which is unpredictable and dramatic. Beside that, the market tends to give dramatic reaction towards bad news, that thing caused by the nature of human which do not want to feel any pain as it is said in prospect theory

## CONCLUSION AND SUGGESTION

Black Swans Anomalies Event is the early thought that underlies the background of this research, the conclusion and suggestion that obtained from the research are that Black Swans Anomalies is exist in BEI from LQ45 index and beside that, Black Swans Anomalies have two characteristics which are bleed and blowup. Bleed happens when investor has loser stock and negative event happens and blowup will happen if the investor has winner stock and positive even happens. When Black Swans Anomalies happens, it will cause overreaction from investor/ market practitioner so that price reversal and winner-loser anomalies phenomenon happen within BEI. For winner stock, overreaction caused by investors that is overconfidence so they cannot make rational analysis and for loser stock, overreaction caused by investors that do not want to feel pain as said in prospect theory.

This research only tests whether the Black Swan affects stock market in Indonesia and makes traders or investors become overreaction so it causes the price reversal and winner-loser anomalies. For the future research it is hoped to be able to test how big the impact of Black Swan towards economic micro variable in Indonesia, testing if Black Swan affects toward small firm or large firm in Indonesia.

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## Attachment 1.Positive and Negative Events



Sumber : yahoo finance, diolah.

Data (Positive Event)	IHSG	Return (Rt)	Average Return ( $\bar{R}$ )	Rt- $\bar{R}$
26-May-10 (the increasing of commodity and crude oil price and weakening value of the yen against the euro )	2696.780029	0.07265365217	0.000896916	0.0718

Source: yahoo finance, processed

Data (Negative Event)	IHSG	Return (Rt)	Average Return ( $\bar{R}$ )	Rt- $\bar{R}$
22-Sep-11 (Warnig from Federal Reserve)	3369.143066	-0.08880348561	0.000896916	-0.0880
3-Oct-11 (monetary crisis in Greece)	3348.708008	-0.05644359163	0.000896916	-0.0556

Source : yahoo finance, processed

## Attachment 2. Winner & Loser Stocks

No	WinnerStock	Average Return	No	LoserStock	Average Stock Return
1	ASII	0.003104482	1	AALI	0.000220258
2	BBCA	0.001249165	2	ADRO	0.000446337
3	BBNI	0.001827478	3	ANTM	-0.000475154
4	BBRI	0.001525991	4	BDMN	0.000195215
5	BMRI	0.001072617	5	INCO	0.000152062
6	GGRM	0.002542308	6	INDF	0.000802411
7	INTP	0.001187518	7	ITMG	0.000888783
8	JSMR	0.002023462	8	PGAS	-3.77352E-05
9	KLBF	0.002638097	9	PTBA	0.000272623
10	LPKR	0.001030461	10	TLKM	0.00046536
11	LSIP	0.001173788	11	BNBR	-0.000561793
12	SMCB	0.00091341	12	ELSA	-0.000426651
13	SMGR	0.001197987	13	ENRG	0.000856302

14	UNTR	0.00167464	14	INDY	0.000408203
15	UNVR	0.001841089	15	ISAT	0.000711944
			16	MEDC	0.000244214
			17	TINS	1.47917E-05

Source : yahoo finance, processed

**Lampiran 3 Average Abnormal Return Saham Winner akibat Black Swan Positif dari t = -5 sampai dengan t = 20**

N=15	Market Adjusted Model			
HARI	Average Abnormal Return	Cumulative Average Abnormal Return	t-hitung	signifikan
-5	0.002400	0.002400	0.525	0.608
-4	-0.007900	-0.005500	-0.709	0.490
-3	0.000700	-0.004900	-0.647	0.528
-2	0.026000	0.021100	2.130	0.051
-1	0.001700	0.022800	1.821	0.090
0	-0.015000	0.007800	0.340	0.739
1	-0.009700	-0.001900	-0.109	0.914
2	-0.004300	-0.006200	-0.344	0.736
3	0.007200	0.001000	0.055	0.957
4	-0.006300	-0.005300	-0.282	0.782
5	-0.000900	-0.006200	-0.308	0.762
6	0.003600	-0.002600	-0.137	0.893
7	0.000300	-0.002300	-0.120	0.906
8	-0.003300	-0.005600	-0.281	0.783
9	0.004800	-0.000900	-0.045	0.965
10	0.005400	0.004600	0.273	0.788
11	0.007600	0.012200	0.865	0.401
12	0.006300	0.018500	1.594	0.133
13	0.003400	0.021900	1.745	0.103
14	-0.000900	0.021000	1.805	0.093***
15	0.012500	0.033500	1.488	0.159
16	0.009800	0.043300	1.842	0.087
17	0.005000	0.048300	2.242	0.042
18	-0.000500	0.047800	2.117	0.053***
19	-0.003600	0.044100	1.959	0.070***
20	-0.004700	0.037300	1.513	0.153

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Sumber : Data olahan dari output SPSS

**Lampiran 4 Average Abnormal Return Saham Winner akibat Black Swan Negatif dari t = -5 sampai dengan t = 20**

N=15	Market Adjusted Model			
HARI	Average Abnormal Return	Cumulative Average Abnormal	t-hitung	signifikan

		Return		
-5	-0.006400	-0.006400	-1.256	0.23
-4	0.000600	-0.005900	0.117	0.909
-3	-0.002500	-0.008400	-0.566	0.581
-2	-0.003100	-0.011500	-1.194	0.252
-1	0.001800	-0.009700	0.653	0.524
0	0.000500	-0.009100	0.053	0.958
1	0.003700	-0.005400	0.409	0.689
2	0.003900	-0.001500	0.609	0.552
3	0.003900	0.002400	0.661	0.52
4	0.006200	0.008600	1.344	0.2
5	0.004800	0.013400	0.984	0.342
6	0.002000	0.015400	0.363	0.722
7	-0.004900	0.010500	-0.577	0.573
8	0.000400	0.010900	0.072	0.944
9	0.002000	0.012900	0.471	0.645
10	0.000000	0.012900	0.001	0.999
11	-0.005100	0.007800	-0.873	0.398
12	0.002900	0.010700	0.616	0.548
13	-0.004400	0.006200	-1.204	0.248
14	-0.001400	0.004800	-0.221	0.828
15	-0.004100	0.000700	-0.855	0.407
16	0.005600	0.006300	0.942	0.362
17	-0.003500	0.002800	-0.72	0.483
18	0.001500	0.004400	0.315	0.757
19	-0.002100	0.002300	-0.498	0.626
20	0.003200	0.005500	0.642	0.531

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Sumber : Data olahan dari output SPSS

**Lampiran 5 Average Abnormal Return Saham Loser akibat Black Swan Positif dari t = -5 sampai dengan t = 20**

N=17	Market Adjusted Model			
HARI	Average Abnormal Return	Cumulative Average Abnormal Return	t-hitung	signifikan
-5	-0.001500	-0.001500	-0.367	0.719
-4	-0.001700	-0.003100	-0.439	0.667
-3	-0.009900	-0.013000	-2.389	0.03
-2	-0.025600	-0.038600	-1.96	0.068
-1	-0.022100	-0.060700	-1.709	0.107
0	0.040200	-0.020500	1.456	0.165
1	0.017200	-0.003300	1.648	0.119
2	0.002500	-0.000800	0.555	0.587
3	-0.006900	-0.007700	-1.734	0.102

4	-0.000200	-0.008000	-0.047	0.963
5	-0.000700	-0.008700	-0.17	0.867
6	-0.003300	-0.012000	-0.51	0.617
7	-0.007200	-0.019300	-2.199	0.043
8	-0.001300	-0.020500	-0.293	0.773
9	0.001500	-0.019000	0.479	0.638
10	0.006500	-0.012600	1.777	0.095***
11	-0.003100	-0.015700	-0.97	0.346
12	0.002300	-0.013400	0.569	0.577
13	-0.007300	-0.020700	-2.873	0.011
14	-0.002600	-0.023300	-0.548	0.592
15	0.004400	-0.018900	0.744	0.468
16	-0.009500	-0.028400	-2.154	0.047
17	0.002200	-0.026200	0.539	0.597
18	-0.000800	-0.027100	-0.276	0.786
19	0.002100	-0.025000	0.795	0.438
20	-0.001200	-0.026200	-0.475	0.641

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Sumber : Data olahan dari output SPSS

#### Lampiran 6 Average Abnormal Return Saham loser akibat Black Swan Negatif dari t = -5 sampai dengan t = 20

N=17	Market Adjusted Model			
HARI	Average Abnormal Return	Cumulative Average Abnormal Return	t-hitung	signifikan
-5	-0.003000	-0.003000	-0.569	0.576
-4	-0.002400	-0.005400	-0.511	0.616
-3	0.000800	-0.004600	0.165	0.870
-2	-0.000200	-0.004800	-0.042	0.966
-1	0.003100	-0.001700	0.780	0.446
0	0.002900	0.001200	0.418	0.681
1	-0.011000	-0.009800	-1.424	0.173
2	-0.025600	-0.035400	-3.147	0.006
3	-0.005200	-0.040700	-0.591	0.562
4	-0.016000	-0.056700	-2.473	0.024
5	-0.008600	-0.065300	-2.191	0.043
6	-0.004900	-0.070200	-0.776	0.449
7	-0.000100	-0.070300	-0.019	0.984
8	-0.005300	-0.075600	-0.773	0.450
9	-0.004100	-0.079700	-0.684	0.503
10	-0.004700	-0.084400	-0.667	0.514
11	-0.000200	-0.084600	-0.033	0.974
12	-0.009300	-0.093900	-3.075	0.007
13	0.004000	-0.089900	0.746	0.466
14	0.020200	-0.069700	1.820	0.087***
15	0.012400	-0.057300	1.480	0.158
16	0.006900	-0.050400	1.001	0.331

17	0.015600	-0.034800	1.828	0.086***
18	-0.014400	-0.049300	-2.881	0.010
19	0.004700	-0.044500	1.116	0.280
20	-0.002900	-0.047400	-0.502	0.622

\* signifikansi pada  $\alpha=1\%$

\*\* signifikansi pada  $\alpha=5\%$

\*\*\* signifikansi pada  $\alpha=10\%$

Sumber : Data olahan dari output SPSS